



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|----------------------------------|-------------|----------------------|---------------------|------------------|
| 10/563,173 | 12/30/2005 | Tuija Suortti | OUTT 3399 | 3755 |
| 7812 | 7590 | 03/17/2008 | EXAMINER | |
| SMITH-HILL AND BEDELL, P.C. | | | SHEEHAN, JOHN P | |
| 16100 NW CORNELL ROAD, SUITE 220 | | | ART UNIT | PAPER NUMBER |
| BEAVERTON, OR 97006 | | | 1793 | |
| | | | MAIL DATE | DELIVERY MODE |
| | | | 03/17/2008 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/563,173 | SUORTTI ET AL. | |
| | Examiner | Art Unit | |
| | John P. Sheehan | 1793 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on ____.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 13-24 is/are pending in the application.
 - 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) Claim(s) ____ is/are allowed.
- 6) Claim(s) 13-24 is/are rejected.
- 7) Claim(s) ____ is/are objected to.
- 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on ____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. ____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 9/19/2006
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ .
- 5) Notice of Informal Patent Application
- 6) Other: ____ .

DETAILED ACTION

Claim Rejections - 35 USC § 112, 2nd Paragraph

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 13 to 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

I. Claim 13, lines 6 and 7, recite, “the obtained metal alloy is cast, and the cast metal alloy is subjected to directional solidification” (emphasis added by the Examiner). The meaning of this phrase is not clear.

Directional solidification is a process that is applied to a molten alloy. In view of this, it is not understood how directional solidification is applied to the previously cast alloy.

II. In claim 14, the penultimate line, the meaning of the term, “precision metal” is not understood. What is a “precision metal”?

III. In claim 14, lines 6 and 7; claim 16, lines 1 and 2; claim 17, line 2; and claim 18, the penultimate line, the phrase, “the metal alloy proper”, lacks a clear antecedent.

IV. In claim 18, line 3, the phrase, “the underpressure” lacks a clear antecedent. Further, the meaning of the phrase, “the underpressure of the

furnace" is not clear. What does the phrase, "the underpressure of the furnace" mean?

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 13 and 15 to 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over each of Mogylny et al. or Schlagel et al. (each of these references were cited in the IDS submitted September 19, 1006) in view of the ASM Handbook (cited by the Examiner).

Each of Mogylny et al. and Schlagel teach a Ni-Mn-Ga ferromagnetic shape memory alloy made by single crystal casting.

The ASM Handbook teaches that directional solidification is used to solidify metal castings with a columnar structure (page 319, first paragraph under the heading, "Directional Solidification"). The ASM Handbook teaches single crystal casting also is a method used to solidify metal into a columnar structure, except in the case of single crystal casting the finished cast alloy is a single crystal (page 322, middle column, the first paragraph under the heading, "Monocrystal Casting"). Thus, single crystal casting is considered to be a columnar structure casting method that is encompassed by the generic term directional solidification. Accordingly, the instantly claimed process step of

subjecting the Ni-Mn-Ga alloy to directional solidification is considered to encompass single crystal casting.

The claims and each of Mogylny et al. and Schlagel et al. differ in that each of Mogylny et al. and Schlagel et al. is silent as to the specific process operating conditions employed to make the disclosed single crystal Ni-Mn-Ga alloy.

However, one of ordinary skill in the art at the time the invention was made would have considered the invention to have been obvious because since as explained above, directional solidification is considered to encompass single crystal casting, the disclosure by Mogylny et al. and Schlagel et al. of single crystal Ni-Mn-Ga alloys means that single crystal, that is, directionally solidified Ni-Mn-Ga alloys are well known. The determination of the proper process operating conditions necessary to produce the known single crystal Ni-Mn-Ga alloy are considered to have been obvious to one in the art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P. Sheehan whose telephone number is (571) 272-1249. The examiner can normally be reached on T-F (7:30-5:00) Second Monday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John P. Sheehan/
Primary Examiner, Art Unit 1793